

KING. (A. F. A.)

A NEW
EXPLANATION OF THE RENAL TROUBLES,
ECLAMPSIA, AND OTHER PATHOLOGICAL PHENOMENA
OF
PREGNANCY AND LABOR.

Read (in part) before the Wash. Obst. and Gynec. Soc., Feb. 4th, 1887.



BY

A. F. A. KING, M.D.,

Prof. of Obst., etc., in the Med. Dept. of Columbian University, Washington, D. C., and
in the Univ. of Vermont; Prest. of the Washington Obstet. and Gynec. Soc., etc.

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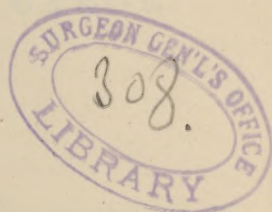
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MAURICEAU spoke of pregnancy as a nine months' malady, and another author wrote, as we are reminded by Dr. Parvin ("Sci. and Art of Obstet.," p. 210): "Woman only escapes being sick twelve times a year by having an illness which lasts nine months." While these statements are partially true with regard to some women, we know there are others who enjoy a remarkable immunity from illness during gestation and express themselves as feeling better, every way, than they did before conception took place.

But *why* some women are well, and others ill during pregnancy, is, in many cases at least, difficult to explain. Especially is this true with regard to the renal troubles of gestation and their accompanying pathological phenomena.

It is the purpose of this paper to present a new explanation (or what I *think* is so) of the etiological relation between

pregnancy and the nephritic derangements that so often attend it.

If I am right with respect to this matter, it will be evident that many other of the pathological conditions, belonging both to pregnancy and labor, may be referred to the same explanation. This paper, therefore, will *not* deal with kidney difficulties *only*, but embrace other correlative pathological states.

To further the end in view, I must first call attention to certain preliminary considerations which it will be desirable to bear constantly in mind. These may be briefly stated as follows:

1. *We must study Nature.* As in all other departments of medical science, so in obstetrics, the key to progress will be found in a studious observation of *natural cases* and a *correct interpretation* of the things observed. While this has already been done by many faithful and enthusiastic clinicians, the results are still deficient and the work incomplete. In fact, our clinical cases of pregnancy embrace chiefly *unnatural cases*—those that exhibit disease. “The well need not a physician, but those that are sick.” In private practice, certainly, pregnant women who suffer *no ills whatever*, usually employ no physician; much less do they submit to the vaginal, abdominal, and other examinations which a scientific investigation of their cases would require. Yet these natural cases are, of all others, those which it is most requisite to understand, and which, it may be supposed, would best repay investigation.

2. *Physiology and pathology must be separated.* To define the normal from the *abnormal* has always been a prime object in the study of disease, and while the statement of so simple a proposition may here seem superfluous, it will, I think, appear less so when we realize that this attempted definition, in so far as it relates to pregnancy and parturition, has hitherto resulted in eminent failure. To formulate our definition, we require a *normal model*, with which abnormal variations may be compared. But where shall this model of normality be found, especially among highly civilized communities? Models of approximate health may, however, be observed. Some are normal in some respects, others in others. We may at least take the normal ingredients from each and put them together, bit by bit. To do so will require the study of one thing at a time. Then, too, we must be sure that our criteria for judging what is normal, and what is not, are fair and just. In this matter ob-

stetricians seem to be influenced, in a measure, by some such principle as "all is well that ends well." A clinical report often finishes with the remark: "mother and child both did well;" but nothing may be said of the untold agonies and dangers endured before the final ending in "recovery" was accomplished. In order to be normal, there should have been *nothing* to recover from. So again, that which occurs *often* is considered normal, while disease is held to be *exceptional*. This also is wrong, or may be so; for if the etiological factors of disease are more frequently present than absent, the abnormal cases may exceed in number the normal ones. On the whole it will, I think, appear farther on (and no matter from what cause or causes) that our leading masters and teachers of obstetric science have in several instances not only confounded the normal and abnormal together, but have committed the additional mistake of calling that normal which is in reality *abnormal*, and *vice versa*, that which is really *unnatural* they have considered natural. The differences of opinion with regard to disputed questions, so often expressed by equally credible and reliable authorities, and based upon equally accurate observations, have, I think, arisen from the observers on one side having met with and noted normal cases, and those on the other abnormal ones, without either being aware of the mistake. At least such must be the conclusion if the views to be expressed in this paper are correct.

3. *The natural conditions of pregnancy must be separated from the natural conditions of labor.* At first sight this again would appear to be a superfluous admonition, yet I shall endeavor to show that the error of confounding the two together has been repeatedly committed, by the most recent and eminent authorities, and with the most disastrous results in impeding the progress of obstetric knowledge. So far from the natural conditions during the two periods being the same, they are not only different, but opposite, for the ends to be attained are directly contrary to each other. It is the office of a pregnant womb to retain the ovum; that of a parturient womb to expel it. The conditions normal in the one case can scarcely be normal in the other. The relevancy of this statement to the matter in hand will be more evident farther on.

With these preliminary reflections, I proceed to the discussion of the etiological relation evidently existing between pregnancy

and the albuminuria, nephritis, anasarca, uremia, eclampsia, etc., that so often accompany it.

4. *Need for further knowledge.* While many theories have been presented in explanation of the cause of renal troubles, etc., during pregnancy, no single one has thus far been universally recognized; none has been so distinctly proven as to merit universal recognition. Even some of our most recent writers have no hesitation in confessing their ignorance upon this subject. Bartels writing in Ziemssen's Cyclop. (Vol. XV., p. 309), says: "For the present there is nothing left for us but to record the fact that parenchymatous inflammations of the kidneys and the liver may be developed during pregnancy, and *to confess that we do not know what causes them.*" On page 306 of the same volume he quotes Rosenstein ("Die Pathologie und Therapie der Nierenkrankheiten," 2te Auflage, 1870, S. 62) to the effect that the pressure occasionally exerted by the gravid uterus upon the renal veins occurs "under conditions that are not thoroughly known to us." Dr. Althaus ("Dis. of the Nervous Syst.," 1877, p. 77) says: "The cause of the appearance of nephritis before and during parturition is still obscure." Even so recently as Dec., 1886, at a meeting of the New York State Med. Association, during a discussion participated in by many of the leading obstetricians of New York, Dr. T. G. Thomas is reported to have said (*Journ. of the Am. Med. Assoc.*, Dec. 4th, 1886, p. 640): "*That while we are ignorant of the method by which the puerperium induces this form of nephritis, we have abundant evidence of the fact that, so soon as utero-gestation ceases to progress, the renal trouble, as a rule, diminishes and soon disappears.*"

Many other authors acknowledge the same kind of bewilderment.

Under these circumstances, there would seem to be ample room for the introduction of some new ingredient within the heterogeneous tangle of ideas comprising our present views upon this subject. In our day, so remarkable for scientific and literary progression, when numerous minds are dwelling long upon the same questions, and prolific printing presses, pregnant with the new conceptions of medical authors, are daily giving birth to nascent ideas, one may well hesitate before ascribing to himself the sole paternity of any new conception in the domain of medicine. Nevertheless, truth compels me to say that I have sought

in vain through a good part of the literature of this matter for any reference to the suggestion it is my purpose to introduce.

5. *The cases to be considered.* The cases I propose especially to consider are those occurring, for the most part, in primiparous women, during the later months of pregnancy, which usually begin with edematous swelling of the feet, face, and hands, with or without general anasarca, attended with scanty, high-colored, albuminous urine, containing renal epithelium, tube casts, and blood-corpuscles, and which sooner or later may develop headache, gastralgia, nausea, vomiting, derangements of the special senses and the usual phenomena of uremia, ending (if not relieved) in eclampsia, premature delivery, etc., and sometimes in death of both child and mother. These are the ordinary cases of uremic eclampsia occurring during pregnancy or parturition. That all the cases should not present *exactly* these phenomena, or that the phenomena themselves should not occur exactly in this order of sequence, will make but little difference, for the etiological views to be proposed will cover one variation of the disease as well as another. Convulsions, however, following severe hemorrhage or profound anemia from other causes, and those of a purely hysterical character, and again those due to previous chronic epilepsy, should of course be excluded, for, unless they occur as accidental complications of the uremic kind, they belong to a different category.

6. *Theory and practice.* While it must be confessed, and with regret, that the substance of this paper is, in the main, theoretical, for pronounced cases of albuminuria going on to uremia and eclampsia are not of frequent occurrence, yet I hope to present the theory with sufficient clearness to secure for it such future observations by others as may be required for testing its correctness or proving its fallacy. While my facilities for clinical observation have been limited, I am still able to present a series of cases, twenty-one in number, which will illustrate the methods of examination to be suggested, and will also contribute negative evidence in support of the theoretical views propounded, that is to say: the cases (thus far examined¹) *not* having albuminuria have been found *not* to present the conditions which the theory states produce albuminous urine, etc. So far the negative evidence thus furnished has been uniformly in favor of the theory. I hope the publication of my views may

¹ Up to Jan. 27th, 1887.

increase the number of examiners in the direction indicated, so that positive evidence also may be supplied sooner than my own limited field of observation would be likely to supply it.

7. *The theory briefly stated.* Disturbances in the renal circulation and renal functions are produced chiefly by pressure of the gravid uterus upon the abdominal aorta or its branches, or upon the vena cava or its branches, or upon both or all of these, *in consequence of the child and womb not maintaining during pregnancy their normal lateral obliquity above the pelvic brim.* This is the pith of the whole matter; and yet one brief statement of this sort can hardly convey the whole theory without further additions, explanations, or qualifications. This statement, however, will constitute the main text and central idea of what is to follow. Now it is evident, before we can proceed one step farther, it will be necessary to define:

8. *The normal attitude of the child in utero during pregnancy, before labor begins.* The definition I will now propose, it must be distinctly understood, does *not* refer to the attitude or presentation of the child during labor, but during pregnancy before labor begins. It is as follows: *The normal "presentation" and "position" of the fetus in utero during pregnancy, before labor begins, is the dorso-anterior position of an oblique presentation* (commonly, inexactly, and erroneously termed a "transverse" presentation). *A head presentation* (as this expression is usually meant to imply presentation of the head "toward the centre of the canal of the pelvis and os uteri" with the long axis of the child parallel with the axis of the plane of the pelvic brim), *is abnormal during pregnancy, etc.* We must next consider the

9. *Normal position of the gravid uterus.* The normal position of the gravid uterus, *in abdomino*, during the later months of pregnancy, before labor begins, is the lateral oblique position, corresponding, more or less, with the oblique position of the child; the fundus uteri, containing the pelvic extremity of the fetus, being usually directed towards the right side (exceptionally to the left) of the lumbar vertebræ. (It should here be observed that while this definition applies to the "position" of the uterus as demonstrated by *abdominal palpation*, the apparent "position" is in part really due to the *shape* of

¹ I use these terms as ordinarily employed by obstetricians when discussing the mechanism of labor.

the organ as it conforms to the shape of its contents ; for while the fundus is towards one side of the mother's spine, the os and cervix may still be found, on *vaginal examination*, with but little or no lateral deviation from the median line.)

Under caption 7, I have stated the renal troubles, etc., are produced in consequence of the child and the womb not maintaining their normal lateral obliquity "*above the pelvic brim.*" These last four words, further elucidated, lead us to discover a

10. *Contrast between the abdominal and pelvic cavities.* When the womb and child, after the fifth month of pregnancy, have risen from the pelvic cavity into the abdominal cavity, in this latter they should remain until the advent of labor. The pelvic canal, in so far as it is concerned with reproduction after this period of gestation, is simply, or chiefly, the *channel of exit*, and no part of the child should again enter here until it is ready to go out and be born ; while the abdominal cavity, above the pelvic brim, is the *cavern of residence*, and here the child should remain, and remain in its entirety, until the proper time for its exit has arrived, or is immediately impending. The relevancy of this statement, and the importance of recognizing its truth (if it be true), will appear farther on, when I shall call attention to an exactly opposite statement almost universally made by modern writers, viz., that in primiparous women the head descends through the brim into the pelvic cavity even as early as three months before labor begins, and which is allowed to pass as a *normal* condition in primiparæ. And this leads me to remark, that

11. *Normal reproduction is the same in primiparæ as in multiparæ.* The whole process of procreation, and the normal position of child and womb, as previously stated, are intrinsically the same in primiparæ as they are in multiparæ. *Under normal conditions*, there is no reason why any difference between them should occur, and none, I think, will be observed—certainly no such exorbitant difference as that in one (multiparæ) the head should remain during pregnancy "upon one of the iliac fossæ," and in the other (primiparæ), "descend into the pelvic cavity three months before full term," for, be it remembered, the same high authorities who, we shall see, admit the difference just stated to be normal, also teach that descent of the fetal head into the pelvic cavity is (not even the *first*, but) the *second* stage or step in the "mechanism of labor." Can it be that this

second step in the mechanism of labor *normally* occurs, in primiparæ, three months before it is time for labor to begin? I should rather say it is abnormal. If the oblique presentation, with the lower end of the fetus resting upon an iliac fossa, be normal for one, it is normal for the other. We believe it to be so in both.

12. *Natural change of presentation before labor. Probable exciting cause of actual labor.* Just before the end of pregnancy, the uterine contractions premonitory of "actual labor" serve to alter the long axes of womb and child from their oblique position, and bring them sufficiently in line with the axis of the plane of the superior strait as to allow the lower end (usually the head) of the fetal ovoid, covered of course by the elastic walls of the supra-cervical segment of the womb, to slip off of the cushioned ledge of iliac fossa on which it has reposed, and, now more nearly opposite the centre of the os uteri, commence its descent into the pelvic cavity. This change in the presentation of the child is probably one of the direct exciting causes of actual labor. It is scarcely necessary to add that, when the premonitory contractions, or actual labor pains, both fail, from some exceptional circumstances, to change the axis of womb and child from their oblique position, and which happens once in about 230 cases, then the *abnormality* of an oblique presentation *during labor* will result.

13. *Obliteration of cervical canal, and Bandl's ring, during the late months are abnormalities.* When the womb and child maintain during pregnancy their normal lateral obliquity, the canal of the cervix uteri, from the external to the internal os, will remain unobliterated until full term; and which is the normal condition both for primiparæ and multiparæ. Under the same normal circumstances, the great thinning of the lower uterine segment, the tearing of the decidual mucous membrane, the "formation of a new cervical canal," and the other tissue changes observed by Bandl, will be absent *during pregnancy*. They are *abnormal*. They may nevertheless occur *during labor* from *abnormal* mechanical obstruction to delivery. None the more, however, does this bring them within the domain of *physiology*.

14. *When the normal obliquity of womb and child is maintained during pregnancy, there will be no injurious compression upon any blood-vessels.* So long as the child remains

poised obliquely, like a slanting beam, above and partly across the pelvic brim, certainly nothing *below* the brim will be compressed: that is apparent. Nor, certainly, while thus obliquely directed, will the fundus uteri and its contents reach high enough to touch the *renal* blood-vessels, which lie on the second lumbar vertebra. It is, therefore, chiefly with the vessels of the intermediate space—the aorta and vena cava and their branches—that we have here to deal with. Let us recall the situation of these vessels. I quote almost *verbatim* from Gray's Anatomy (2d Am. Ed., pp. 418, 428, 436, 474, 475). The abdominal aorta descends “a little to the *left* side of the vertebral column, terminates on the *left* side of the body of the *fourth lumbar vertebra*, where it divides into the two common iliac arteries.” “This point corresponds to the left side of the umbilicus, and is on a level with a line drawn from the highest point of one iliac crest to the other.” The common iliacs, diverging from the termination of the aorta, pass downwards and outwards to the margin of the pelvis, and divide opposite the intervertebral substance between the last lumbar vertebra and the sacrum. The external iliac passes obliquely downwards and outwards along the inner border of the psoas magnus muscle to the femoral arch. The ascending vena cava is in front of the spine, on the right side of the aorta. The common iliac veins unite “upon the intervertebral substance between the fourth and fifth lumbar vertebræ.” Thus we find these large vessels and their primitive divisions disposed over the most projecting part of the lumbar curve, the aorta being a little on the left of the median line—the *fourth* lumbar vertebra being the *most* prominent in the anterior direction. A transverse, or obliquely transverse, section of the abdominal cavity at this level will exhibit at its central posterior part a sudden convex projection made by the lumbar spine, with two moderate sized lateral concavities which pass forwards to unite in forming the larger concavity of the anterior abdominal wall. The included space will be somewhat reniform in shape, but it will more nearly resemble the surface displayed by making a median, longitudinal, antero-posterior section of a fetus in utero, provided that the head, spine, and extremities be flexed, as we usually find them. The section of a woman's abdominal cavity, and the section of a fetus thus displayed, will exhibit a striking resemblance to each other; and, when the child's back

is directed anteriorly, which it usually is (for in all presentations the dorso-anterior positions are most frequent, as well as most desirable), and the long axis of its body is placed obliquely across the woman's abdomen, with its head, spine, and extremities flexed—under these circumstances the convexity of the child's dorsal surface and of the anterior uterine wall will fit well within the concave surface of the anterior wall of the abdomen, while the deep and sudden sulcus between the flexed knees and forehead of the child (see plate 72, p. 125, Leishman's Obstet. 3d Am. Ed.), covered only by the ductile web of the elastic uterine parietes, cushioned inside by liquor amnii, *will afford space, posteriorly, for the projecting lumbar vertebræ and the large blood-vessels placed upon them.* At least that portion of the womb in contact with the lumbar vertebræ will contain no hard part of the fetus by which injurious compression of the blood-vessels could be made.

It will be further observed that the lower part of the gravid womb containing the fetal head, when posed upon the left iliac fossa, or rather upon the psoas and iliacus muscles with which that fossa is upholstered, will, in consequence of the *downward and forward inclination* of both muscles and fossa, constantly tend to glide forwards, and *away* from the *left* side of the woman's spine—*away from the aorta and iliac vessels, etc.* At the same time the pelvic end of the fetus will be directed obliquely upwards and to the *right* side of the lumbar spine, where there is *no important vessel to be compressed.*

The long axis of the fetus, when thus obliquely placed, will occupy a *trebly* complex diagonal position. It will be *oblique to the horizon*, the breech being higher than the head; *oblique laterally*, the breech to the right, the head to the left; and *oblique antero-posteriorly*, the head being more in front, the breech more behind. By this complex diagonal position the womb and child make the very best use of the limited space which the abdominal cavity affords, crowding of and pressure upon neighboring structures being prevented.

When, on the contrary, the womb and fetus maintain a vertical position (*i. e.*, not vertical to the horizon, but with their long axes in line with the axis of the plane of the pelvic brim), they are continually crowded for space by their abdominal surroundings, and the direction of this crowding is chiefly downwards and backwards—in fact towards the lumbar spine and the blood-

vessels that lie upon it. And finally the lack of space for the long axis of the womb compels its lower segment, containing the child's head, to descend *prematurely* out of the abdominal cavity into the pelvic one, which occurs most often in primiparæ, and with all the disastrous results to which this abnormality sometimes leads, as will be shown hereafter.

It should not be overlooked that the normal attitude of the child, besides being oblique as stated, is also *dorso-anterior*. Should the back of the child be directed towards the mother's spine, the spinal curvature of the fetus (which is observed from the earliest stages of embryonic development), so far from agreeing with a transverse section of the woman's abdominal cavity, will *disagree* with it, for the convex surface of the child's back will impinge upon the convex projection of the mother's lumbar vertebræ, and thus the tendency to injurious pressure upon the aorta, etc., would be increased.

15. *Will pressure of the gravid womb upon the aorta, vena cava, and their branches produce renal trouble?* On this point there has been much difference of opinion. Many writers speak of pressure upon the *renal veins*, or upon the *kidneys* themselves, as if these received the brunt of uterine pressure; but I think, after the very able disputation of this view by Dr. Bartels (Ziemssen's "Cyclop.," Vol. XV.) we can no longer admit the supposition.

It will scarcely comport with my present purpose to review the literature of the question proposed at the beginning of this section. It must suffice to accord it an affirmative reply, for which ample authority might be adduced. Nor is it difficult to understand how the cause (uterine pressure) produces the effect (renal disturbance). The current of blood in the aorta being retarded must necessarily lead to tension of that vessel and its branches above the point of compression, and among the first of these branches to feel such tension must be the renal arteries, placed only a very short distance above, and being also of comparatively large calibre; while compression of the vena cava below, retarding the upward current of venous blood, will retard the exit of blood from the kidneys through the renal veins. Hence we might suppose, *a priori*, that the renal congestion would be either active or passive, according, respectively, as the aorta or vena cava were most forcibly compressed.

But another factor that may certainly influence the function

of the kidney, and add to the vascular disturbance produced by pressure upon blood-vessels, is compression of the *ureters* by the gravid womb. Löhlein found dilatation of one or both ureters in twenty-five per cent of the deaths from puerperal eclampsia, and in three per cent only of deaths from other causes (Barnes' "Obstet.," p. 292, quoting from *Deutsche Med. Zeitung*, 1883).

Admitting ureteral compression as a cause of renal disturbance, by no means necessitates the exclusion of the vascular compression before stated; in fact, it is more than likely that when one occurs, the other will also, and from the same cause. But I must here repeat with emphasis that, when the child maintains its normal lateral obliquity above the pelvic brim, and its dorso-anterior position, *nothing* will be injuriously compressed; while under opposite circumstances, when the head presents during pregnancy at the brim, and descends into it three months before full term, *all* neighboring canals, whether arteries, veins, ureters, or lymphatics, may receive disastrous pressure and interference with the transit of their contents. Though not altogether belonging to this section, it may here be remarked that pressure of the gravid womb upon the receptaculum chyli and upon the lymphatic vessels from the lumbar glands that empty into it (and which lie upon the second, third and fourth lumbar vertebræ), has perhaps not received the attention it deserves, in contributing to the faulty nutrition, hydremia, and anemia, often found to exist in some pregnant women. But these, again, will escape pressure when the child is normally placed as before stated.

16. *The diagnosis of aortic and vena-caval compression during pregnancy and labor.* Edema and venous congestion of the lower extremities is the best evidence of venous obstruction higher up. Additional evidence may be found, however, in the occurrence of hemorrhoids, varicose veins and thrombi of the vulva, and congestion of the vagina and cervix uteri.

Aortic compression would seem to be indicated by the observed tension of the arterial system above the obstructed point, as shown by tension of the radial pulse, and which is especially pronounced in uremic cases. But I must now call attention to another mode of diagnosis, which has not been usually practised, viz., *feeling the pulsation of the femoral arteries below Poupart's ligament.* In the twenty-one pregnant women that I have lately examined in this way, the femoral pulses could

be easily felt, and appeared to possess their normal tension, but in none of these women was there any abnormal tension of the radial pulse, nor yet any albuminuria or other indication of renal derangement. In none of them either had the head descended into the pelvic brim, but remained above it poised upon one of the iliac fossæ.

17. *The relation of eclampsia with renal disturbance and with abnormal position of the child, etc., during pregnancy.* As is well known, various explanations have been given of the eclamptic paroxysms during pregnancy and labor; and while the fits are explicable in some cases in one way, and in some in another, I hope to show that the several kinds of cases and their alleged preceding pathological states may all, or nearly all, be traced back to the one chief and original factor of disturbance, viz., *mal-position of the child, i. e.,* presentation of one end of the fetal ovoid instead of an oblique presentation, as before explained. Let us consider first:

(a) *Cases with albuminuria, nephritis, and uremia.* In these cases, the convulsions occur much in the same way as they do in males suffering from uremia consequent upon Bright's disease. Whether the spasms be due to the retention of urea, or its decomposition into carbonate of ammonia, etc., may matter little, for disease of the kidney is, in these cases, *known* to be the root of the evil. Hence it brings us back to the origin of the renal trouble, which we have already referred to, pressure of the misplaced fetus and womb upon the aorta, vena cava, etc.

(b) *Cases without, or with but little, albuminuria, or kidney trouble, but in which albuminuria, etc., may be produced, or increased, by the convulsions.* These cases are explicable upon the "uterine irritation" theory of Tyler Smith, who maintained that true puerperal convulsions were produced either by centric irritation of the spinal marrow, or by eccentric (peripheral) irritation of it, produced "by an excited condition of an important class of incident nerves, namely, *those passing from the uterine organs to the spinal centre, such excitement depending on pregnancy, labor, or the puerperal state.*" But how shall we account for this abnormal irritation of the uterine nerves? It cannot be considered a physiological condition; and with our hitherto prevalent notions of what constitutes normal pregnancy, the occurrence of eclampsia from uterine irritation before

labor begins is the more difficult. When, however, we have decided that conditions hitherto called normal, are really abnormal, the matter becomes more easy. I therefore beg to maintain that *premature obliteration of the cervix uteri, premature distention of the cervical canal and lower uterine segment, with thinning of its muscular wall, and tearing of its decidua; and premature descent of the lower end of the fetal ovoid below the pelvic brim*—all due to a want of that lateral obliquity of the fetus during pregnancy, which would have allowed the weight of the uterine contents to find support upon an iliac fossa, instead of upon the lower segment of the womb—are amply sufficient to account for the uterine irritation which Tyler Smith conceived to be the peripheral excitator of convulsions, even when there was but little or no renal disturbance. And that the spasms, in such cases, should occur with more frequency and severity during labor need not surprise us in the least, for we then have the additional irritation of a child's head being forced through a sphinctorial orifice (the os uteri) which is already in a condition of abnormal irritation, from the tissue changes that have taken place in it during pregnancy. More than this, I am strongly inclined to the belief that the rigid, thin, feather-edged, undilatable os uteri which so often leads to tedious labor in primiparous women is the result of these very morbid changes in the os and cervix that have previously taken place in the manner described.

That cases of convulsions, occurring from this reflex uterine irritation *without* albuminuria, should develop albumin in the urine during or *after* the convulsive paroxysms is to be explained by the *violent contractions of the abdominal walls and diaphragm*, which occur as part of the spasm, added to the contractions of labor pains, *forcing the gravid womb*, itself also hardened by spasm and labor pains, *against the blood-vessels, and thus causing derangement in the renal circulation.*

(c) Cases of convulsions—whether with or without renal trouble—have again been ascribed to centric nervous irritation occurring as a part of that general irritability, or “convulsibility,” which has been considered not uncommon during pregnancy, and which some have thought due to anemia, and others to plethora or congestion of the brain and nerve centres. There would scarcely seem to be much ground for the *anemic* view. The relief usually afforded by venesection contradicts it; and,

moreover, the tension of the radial pulse is directly indicative of a condition of the brain opposite to that of anemia. The theory of cerebral congestion or hyperemia, on the contrary, is supported on all sides. It becomes necessary, however, to define whether this centric cerebral congestion be venous or arterial in character, for while an excess of arterial blood in the brain will produce convulsions, an excess of venous blood will not, but, on the contrary, lead to muscular relaxation and coma. Venous blood is sedative to the brain; arterial blood, stimulant. It is the excessive venosity of the blood, resulting from spasm of the respiratory muscles and consequent suspension of respiration, that *ends* the convulsive paroxysm. As the late Prof. Joseph Carson remarked in his famous review on Puerperal Eclampsia (*Am. Jl. Med. Sci.*, April, 1871, p. 459): "When the brain is finally deluged with black blood, partly from the impediment to the return of venous blood from the organ, and partly from the propulsion of non-aërated blood into it as the heart regains its power, the convulsion subsides and coma is substituted for it. This is *natural narcotism*."

The cerebral congestion, productive of eclampsia, therefore, must be *arterial* congestion. And this is easily accounted for by pressure of the gravid womb upon the aorta, impeding the aortic stream and causing it to back up in the brain; while uterine pressure upon the vena cava retards the upward current of venous blood and causes this latter to accumulate below the point of compression. We may thus reach the conclusion, as I endeavored to point out over twenty years ago, that puerperal convulsions may be "due to an abnormal excitation of certain central parts of the cerebro-spinal nervous system, caused by an increased afflux of *arterial* blood and a deficient supply of *venous* blood circulating through those centres." (*N. Y. Med. Jour.*, October, 1865, pp. 27-31.) This view has been also maintained by several later writers.

(d) Convulsions may be produced when the nervous system has attained the irritability or "convulsibility" previously noted, by local irritations seated in the stomach, bladder, or bowels, or by violent mental emotion, as well as by rude and violent manipulations during delivery by version, forceps, and other operative procedures. Even the normal phenomenon of a labor pain, under the circumstances, may produce a paroxysm.

(e) Cases may occur in which several or all of the foregoing conditions co-exist.

Thus, then, whether the convulsions be referred to uremic intoxication, or to uterine irritation, or to cerebral hyperemia, or to reflex local irritation in other viscera, or to several or all of these coincidently, they may all be accounted for by *pressure of the gravid womb and child, when the normal lateral obliquity of the latter is wanting.*

18. *Puerperal convulsions of the apoplectic type.* I have always considered the separation of this class of cases from the more common epileptic variety as an unnecessary complication of the subject. Should a woman, during an eclamptic seizure of the ordinary epileptic kind, rupture a cerebral blood-vessel, or become the subject of serous effusion or extravasation in the cranium, and in consequence remain comatose, paralyzed, and die without any return of sensibility, the case is forthwith set down as an apoplectic convulsion, and so in truth it is, but at the same time the apoplexy occurs only as a complicating *accident* of epileptic eclampsia. We do not therefore need a *separate etiology* for apoplectic convulsions—they are secondary accidents of the epileptic cases. Our ideas of *etiology* can no more be based upon the lesions found in the brain in apoplectic cases, than they can upon lesions found in the lung, for pulmonary emphysema, edema, and apoplexy also occur as complicating accidents of the epileptic seizures. To base our ideas of etiology upon the fatal lesions that suddenly cause death is like examining the burst tubes and boiler of a locomotive engine after a railroad collision; these teach us nothing of, and would never suggest, the true cause of the accident, viz., a want of that lateral obliquity in the direction of the train which prevented it from switching off on one side so as to avoid collisional impact with its fellow. So, in like manner, the ruptured cerebral or pulmonary blood-vessel occasionally resulting from an eclamptic paroxysm afford no suggestion as to the *cause* of the convulsion.

19. *Causes of disturbance of the normal lateral obliquity of womb and child, and of their premature descent below the pelvic brim, especially in primiparæ.* While the conditions stated, and also their causes, occur most frequently in primiparous women, they also occur with less frequency in multiparæ. The reason most generally alleged for injurious pressure of the

gravid womb being greater in primiparæ than in multiparæ, is *tension of the abdominal walls*—they have not, it is said, been stretched by a previous pregnancy. While it may not be possible to present evidence in refutation of this idea, and while the tension referred to must perhaps be admitted as a contributing factor in producing abnormal pressure, yet it seems to grate against reason when we are pushed to the supposition that a young female in the best of health, and in the prime of womanhood, has been endowed by Nature with every provision for normal reproduction, *except that her abdomen will not grow*. The diminutive, unimpregnated womb expands to its gigantic full-term proportions readily enough, and the other structures of the reproductive system execute the respective changes required of them by pregnancy, and yet by some strange omission in the natural make-up of the female, *capacity for abdominal expansion, commensurate with the growth of the uterus, has not been provided for!* As I have said, this supposition grates against reason. We can scarcely admit the *natural* lack of capacity for abdominal expansion in a *healthy* woman. We must therefore seek for some artificial or abnormal factor or factors, by which natural abdominal expansion has been interfered with or prevented. These will not be difficult to discover, especially in primiparous women. Among them (there may be others) are *dress, corsets, coitus*, and certain *abnormal postures*.

When we consider how very seldom the physician examines, *per vaginam*, young primiparous women in the *erect posture* and with their *usual clothing intact*, there is little positive evidence as to whether or not the mere pressure of waist-bands, with the weight of skirts appended to them, exercise any injurious pressure upon the abdomen and fundus uteri during pregnancy. We usually make such examinations in the recumbent posture and with the clothing for the most part removed. Yet while clinical evidence on either side may be lacking, we cannot escape from what we already know with regard to the *mobility of the uterus*. We observe it to descend from its own weight during the first two months of pregnancy; and then later as, growing larger, its slanting external surfaces (small below, large above) impinge against contiguous structures, the slippery wedge (or cone) glides gradually upwards above the pelvic brim. We note how easily it may be depressed by the gynecologist's bimanual examination. Examined by inspection,

we observe the vaginal portion of the cervix to move up and down, even by so slight a force as that exercised by the action of the diaphragm in respiration—an observation rendered doubly evident during coughing, laughing, sneezing, etc.

All considerations lead us to the conclusion that the opposing factors of ascent and descent are, in a state of nature, somewhat *nicely balanced*; and that when one predominates over the other, in conformity with the natural requirements of different periods of pregnancy, the predominance is *not* in any greatly superfluous or redundant degree. Hence it is not unreasonable to suppose that the pressure of waist-bands and the weight of appended skirts, when the female is erect, may contribute to disturb this balance, and either prevent or retard the womb rising at the proper time, or injuriously compress it when it has risen. This seems to have been understood (practically at least) by the women of Rome, centuries ago, who, as Parvin reminds us ("Obstetrics," p. 211), "laid aside their girdle, the *fascia mammillaris*, when they became pregnant."

But if the pressure of skirts and waist-bands, comparatively light and loose though they be, is in any degree prejudicial, how much greater must be the injury inflicted by the wearing of *corsets*!

We do not yet, I think, thoroughly enough appreciate the influence of wearing them upon the pregnant womb. The woman will often enough stand before us, and lifting up the lower anterior border of the corsets, declare "they are quite loose." And so they seem to be as she, unconsciously perhaps, draws in the abdominal wall. But note what takes place when she sits down. The spine is no longer so erect; the constriction at the waist is crowded down towards the pelvis; the expanding lateral borders of the corset far overlap the iliac crests; while in front the median point of the stays—near the navel while the woman stood erect—now dips to the *mons Veneris* or even completely over it to the inter-femoral space. A distended abdomen will inevitably bulge forward in the sitting posture, for the spine and thighs then more nearly approach each other and so shorten the vertical diameter of the abdominal cavity. Corsets, therefore, which may appear loose enough while the female stands erect, may exert much greater pressure in the sitting posture. And, farther, should the pregnant woman stoop to pick up a pin or other trifle from the floor—a not uncommon occurrence

certainly—the pressure then exerted upon the fundus uteri would be still more increased. And now if these effects follow corsets *loosely* (?) worn, by what measure shall we compute the pressure when they are confessed to be *moderately tight*, “merely to preserve the figure as long as possible”? And finally, when the unfortunate victim of an illegitimate pregnancy laces as tightly as she can, and with reckless disregard of consequences, in order to conceal her condition, the pressure upon the womb must then be far beyond the natural means provided for maintaining the organ in the abdominal cavity. And thus perhaps it is why seduced women are frequently the subjects of puerperal eclampsia, though usually this has been ascribed to mental or emotional causes.

Let us not fail to note also, and particularly, that corsets, whether tightly or loosely worn, exert *symmetrical* pressure, equal on both sides, and hence the womb and child, forced out of their normal and *unsymmetrical* lateral obliquity, have their long axes maintained more nearly parallel with the axis of the plane of the pelvic inlet, and thus, instead of resting obliquely, supported below upon one of the iliac fossæ, in the cavity of the *abdomen*, drop, or are forced prematurely, into the cavity of the *pelvis*. It is almost needless to repeat that it is in the primiparous woman that this pathological condition is most frequently observed: and it is she also, generally speaking, who is most concerned about her figure. After having had one child, she becomes, as a rule, less fastidious in this particular, and submits to the inevitable with less resistance.

In addition to skirts, girdles, and corsets, we may next consider the weight of the hands and arms (or rather forarms) superimposed one over the other above the fundus uteri. As these limbs are thus disposed over the upper region of the abdomen, the additional pressure upon the enlarged womb must be considerable. It is almost unnecessary to say that this gesture or position is an exceedingly common one with pregnant females when in the presence of company by whom they do not desire their situation to be observed. Such women also, even when standing erect, adopt an unnatural attitude, that of bending forward, in order to conceal their condition, which is exactly opposite to their normal posture. Naturally, and in order to preserve the centre of gravity of the body against the tendency to fall forwards occasioned by the weight of the pregnant womb

in front of the spine, the pregnant woman stands with the head, shoulders, and spinal column inclined backwards (as explained by Matthews Duncan), and Montgomery refers to this normal posture ("Signs of Pregnancy," p. 7) as giving to the female "that pompous air which is so often unjustly attributed to a wish to make a display of her condition."

And next with relation to *coition during pregnancy*. The abstract statement that coition during pregnancy is at all times unphysiological, though intrinsically true, need not here be discussed.¹ It will suffice to observe that the dorsal decubitus of the female, with flexion of the thighs towards the abdomen, and with a part of the weight of the superimposed abdomen and body of the male, must tend to force the uterus down towards the pelvic cavity, and contribute to counteract the normal tendency of the organ to rise and remain above the pelvic brim. It may be added that coitus, as a rule, will be repeated more frequently in young newly-married primiparæ than in older, multiparous women.

On the whole, I think we are justified in concluding that the abnormal factors now cited will be sufficient to explain disturbance of the womb and child from their normal lateral obliquity and their premature descent below the pelvic brim, especially in primiparæ, without our being compelled to refer these abnormalities solely to the tension of the abdominal muscles. We ought, however, perhaps to consider that the want of natural expansion in the abdominal walls during pregnancy may be due to *actual deformity* or *tissue changes* in these walls, produced by the compression of tight-lacing, continued possibly for years, before the occurrence of conception.

With relation to dress during pregnancy, we freely indorse the statement of Dr. B. W. Richardson ("Preventive Med.," p. 650) that "the clothing of the expectant mother requires special care, since under the present system *it is the worst that by any mortal ingenuity could be devised*. The clothing should be light, warm, and *borne entirely from the shoulders*; anything like tight bands or corsets round the body are equally injurious to mother and child."

¹ I have already expressed my own views on this subject in a paper read before the Washington Obstetrical and Gynec. Soc., Jan. 2d, 1885; and again, briefly, before the Anthropological Soc. of Wash. (See Trans. Anthropol. Soc., of Wash., vol. 1, pp. 36, 37, March 1st, 1881.)

In fact, the wonder is, that so many pregnant woman escape with only the slighter ailments occasioned by pressure upon the gravid womb. That, in spite of the artificial appendages to her person, and the other abnormal influences just mentioned, woman should but rarely suffer serious or fatal injury must lead us to exclaim that Nature is indeed beneficent, and her resources unexpectedly ample.

Anthropologists tell us that there are, still living in this world 250,000,000 inhabitants, whose wardrobes consist of something less than the "traditional fig-leaf." It would be extremely interesting, as well as profitable, to ascertain the position of the womb and fetus in the pregnant women of these tribes, and whether the renal and other troubles of their primiparae occur as frequently as among the clothed women of civilized nations. But we have, I think, no reliable data upon this point at present.

20. *Do convulsions, nephritis, etc., occur in cases of "transverse" presentation during labor, and in most of which cases the child was, it may be presumed, oblique and wholly above the pelvic brim during pregnancy?*

When I had reached the theoretical views previously expressed, it was difficult to avoid the *a priori* conclusion that women with transverse presentation ought to be more or less exempt from the effects of uterine or fetal pressure upon neighboring blood-vessels. On consulting the works of recent obstetric authors upon this point, I find many of them are completely silent with regard to it. At least I find no reference to it—and I have searched with tolerable care—in the works either of Leishmann, Playfair, Lusk, Barnes, Parvin, Byford, Meigs, Galabin, Ramsbotham, Jr., or Velpeau (Meigs' translation). They appear to have paid no attention to the relation of eclampsia, etc., with cross presentations. At the same time, it will be observed that in discussing the "obstetric treatment" of eclampsia, they refer exclusively, or almost exclusively, to head presentations. None of them tell us what to do in the way of obstetric treatment in cases of convulsions when the child is presenting transversely, and which would seem to indicate, though not, of course, with any certainty, that they have seldom or never met with such cases.

The records of obstetric literature, however, are not entirely barren on this question.

Dr. Robert Collins, one of the masters of the Dublin Lying-in Hospital (Collins' "Midwifery," Am. Ed., 1838, pp. 102-103), remarks: "There was but one case of convulsions, during my residence in the Hospital, where the child presented preternaturally; there was not one case with a preternatural presentation during Dr. Clarke's residence, and Dr. Labatt has stated the same fact in his lectures while master of the Hospital. In these three different periods there were 48,397 women delivered, so that from this we may infer, where the presentation is preternatural, there is little cause to dread the attack." I must here specially remark that no statement is here given as to whether the *preternatural* case was a breech, face or transverse presentation, for in those days a preternatural presentation was understood to mean "any presentation other than that of a head." With relation to this particular case, however, mentioned by Dr. Collins, we are fortunately no longer in doubt, for he states (p. 103) that "thirty cases of convulsions occurred in the Hospital during my mastership; . . . in *fifteen* of the 30 the patients were delivered by the natural efforts; in *six*, delivery was effected by the forceps; in *eight*, by the perforator and crotchet; and in *one* the *feet presented*."

Denman ("Introduction to Pract. of Mid.," 7th ed., 1832, p. 430) says: "I was for many years persuaded that convulsions happened only when the *head* of the child presented; but experience has proved that they sometimes occur in *preternatural* presentations." He does not specify that they occur in transverse presentations, and his definition of preternatural presentation (p. 337) includes breech and inferior extremities as well as shoulder and superior ones.

Dr. Fleetwood Churchill observes ("Theo. and Pract. of Mid.," Am. ed., 1866, p. 475) that "when convulsions occur at the commencement of labor, it might naturally be attributed, in some cases at least, to mal-presentation of the child; but this is *not* the case. Mal-presentation is observed very rarely in cases of convulsions." His definition of "mal-presentation" (p. 409) includes any part other than the head.

Dr. Carl R. Braun ("The Uremic Convulsions of Pregnancy," etc., translated by Duncan, 1858, p. 56) says: "Faulty position of the child is so seldom found in eclampsia that we are not warranted in assuming a causal relation between the two." On page 156, referring to the obstetric treatment of

eclampsia, he further remarks: "Presentation of the shoulder and pelvis, which are very rarely observed at this" (referring to the expulsive) "stage of labor in eclamptic cases are to be treated on general principles," etc. This is just about what any one would say, in writing a complete essay on the subject whether such cases *had* or had *not* been met with. The statement also mingles together presentations of the *shoulder* and *pelvis*, which is unfortunate; for it will be seen farther on that breech presentations *may* be associated with eclampsia.

Dr. Gunning S. Bedford ("Obstetrics," 1867, note to page 497) says: "It is an interesting fact to note that when convulsions occur during labor they do so, in the great majority of cases, in head presentations; and, strange as it may appear to those who have not examined the subject, they are extremely rare in mal-positions of the fetus."

Rigby ("On Midwifery," 1851, p. 329) remarks: "It is rare to find convulsions complicated with mal-position of the child; indeed, so uncommon is the occurrence of it under these circumstances, that we may feel almost certain, on being summoned to a case of convulsions, that there will be little chance of this additional difficulty being superadded."

Dr. Thomas More Madden tells us that "in almost every instance of puerperal eclampsia that I have met with the presentation was natural, and the experience of most other practitioner is similar to my own, on this point" ("Proc. Dublin Obstet. Soc.," May 9th, 1874, p. 162).

In a paper by Dr. Fr. Schauta, Clinical Assistant to Prof. Späth, of Vienna (See *Archiv für Gynäcol.*, vol. XVIII., p. 274, 1881), containing statistics of the obstetric clinic of the Vienna Hospital, from its foundation in 1834 till the end of June 1880, we find a record of 134,345 deliveries, embracing 344 cases of convulsions. Of these 344 cases of eclampsia the presentation was noted in 315, as follows:

Head presentation,	.	.	.	.	.	304
Face	"	.	.	.	.	4
Breech	"	.	.	.	.	5
Footling	"	.	.	.	.	1
Transverse	"	.	.	.	.	1
Total,						315

It may be worth while to mention here that in 306 of these eclampsia cases, of which further details are given, there were 253 primiparæ and only 53 multiparæ; total, 306.

With regard to the presentation, Dr. Schauta remarks that the enormous prevalence of head presentation attracts attention which cannot even be explained when we consider that a majority of the women suffering from eclampsia were in their first pregnancies.

Thus the records of the Vienna Hospital furnish one case of convulsions associated with transverse presentation of the child. I shall have more to say of this unique case presently.

Dr. Francis H. Ramsbotham ("Syst. of Obstet.," Am. ed., 1861, Keating, p. 425) mentions 59 cases of convulsions which he personally attended, and of the 62 children (there were three twin cases) he says :

- 41 were expelled naturally by the head ;
- 6 were delivered by craniotomy ;
- 6 by forceps ;
- 5 by *turning* ;
- 4 presented with the breech.

Total, 62

Eliminating the four breech cases, all the rest, it may be presumed, were head presentations, except perhaps the *five* delivered by *turning*. Of these last, however, we must note that he makes no mention of them having been *transverse* cases, as it is most likely he would have done had they been so, inasmuch as he *did* specify the breech cases. Moreover, turning is one of the methods of treatment he recommends in eclampsia, regardless of the presentation; thus he says (p. 433, see also 434): "Should the membranes be unbroken, we may turn the child and deliver by the feet." Furthermore he tells us (note to page 353) that he "delivered two hundred women under transverse presentations. Many of these cases presented a formidable appearance," the membranes having been ruptured as long as from two to seven days, in several, before the operation. In four evisceration or decapitation was necessary, but in no instance does he mention the complication of eclampsia.

He remarks further that in none of the cases did he bleed, except in a few "*to relieve the inflammation from which the soft structures were suffering, and to remove tumefaction.*" Now, had there been convulsions in any of these cases, I think he *would* have bled for *that* complication, and would also have recorded the fact, for on page 432, under the head of "*Treat-*

ment of *Convulsions*," he says: "Bleeding is our great reliance—the lancet is our sheet-anchor."

On the whole, therefore, I think we may fairly conclude that the entire 59 cases of eclampsia did *not* include a single one coupled with transverse presentation.

In 7,404 deliveries in the Lying-in Charity of Guy's Hospital ("Guy's Hosp. Rep.," 2d series, No. 2) there were fourteen cases of puerperal convulsions, all of them being head presentations, except one, which was "footling and funis presentation with partial presentation of the placenta."

Dr. Robert Lee's "Midwifery" (pp. 403–409, 1844) contains a tabular statement, with only irregular brief details, of 54 cases of convulsions, given in numerical order. Of these I make the following synopsis:

Under group 1 we may include those in which it is distinctly stated that the "head" presented, and those in which forceps, perforation, or craniotomy were employed, and which we infer were head cases. The number in this group was,	23
Face presentation, forceps used,	1
Under another group I include those of which it is said "labor was natural," or "delivered without assistance," or "by natural efforts," and which we may presume were head presentations. This number was,	15
Another group contains no mention or suggestion, either as to presentation or mode of delivery. This number being,	10
Case No. 44. Convulsions at seventh month, not delivered, got well, went to term,	1
Case No. 41. "Safely delivered,"	1
Case No. 52. "Artificial delivery" had recourse to,	1
Case No. 1. "Easily turned and delivered,"	2
Case No. 16. "Turning,"	
Total,	54

While, of course, it would be unfair to assume that in these cases of Dr. Lee's there was *no* transverse presentation, yet we cannot help but remark that no mention is made of such a case. Turning (in the two last-named cases) may have been employed in any presentation. Dr. Lee, it is true, mentions one case of face

presentation (Case No. 31). It is likely he would have mentioned a transverse one had it occurred. But of this we must remain in doubt. I present the record for whatever it may be worth on either side.

Dr. Lee also presents a statement (pp. 335-339), again with meagre details, of 71 cases of shoulder presentation, some of them a long time in labor, and submitted to great violence during delivery. He says (p. 334): "In a great proportion of these the operation of turning was undertaken in the most unfavorable circumstances both for the mothers and their children, after the liquor amnii had entirely escaped, and the uterus had not only been contracting many hours around the child, but repeated unsuccessful efforts had been made to deliver. Seven died from rupture of the uterus. Of the 71 cases, twelve were twins, and one triplets." But he mentions *no case complicated with eclampsia*.

Dr. Merriman ("Difficult Parturition," 1838, pp. 147-148) gives 48 cases of convulsions, but with meagre details, as follows:

In 6 convulsions after delivery. Children all alive. No mention of presentation.

3 were twins. "All delivered without artificial assistance."

11 were delivered by forceps.

9 delivered by perforator.

4 the operation of version was resorted to. Two of the women recovered. All the children were dead-born.

14 delivery without extraordinary assistance.

1 died undelivered. No mention of presentation.

Total, 48

Here again, unfortunately, the want of details leaves us in doubt. All we can say is that no case of transverse presentation is mentioned.

Dr. John Ramsbotham ("Practical Observations in Mid.," 1842) presents sixteen observations (cases) of eclampsia as follows:

Convulsions *previous* to labor:

CVII. Died undelivered. *Setio cadav.*: "Uterus with child in it was in a natural and healthy state."

- CVIII. Fetus and secundines expelled during one of the paroxysms.
- CIX. Child expelled naturally.
- CX. Child expelled dead during her struggles.
- CXI. Twins. Breech presentation: delivered by hand grasping feet. Second child delivered in same way.
- CXII. Os dilated. "Turning on account of imminent danger of woman."
- CXIII. Natural and easy labor.
- CXIV. Natural labor.
- CXV. Natural labor, though turning *had been considered*.

Convulsions *during* labor :

- CXVI. Head above brim.
- CXVII. Child naturally expelled.
- CXVIII. Head presentation. Forceps.
- CXIX. Head presentation.
- CXX. Head presentation.

Convulsions *after* labor :

- CXXI. Easy, natural labor.
- CXXII. Labor quite natural.

Among the 16 cases thus presented by Dr. John Ramsbotham, it is most probable, though not of course certain, that there was no case of transverse presentation.

Dr. J. T. Ingleby ("Obstetric Medicine," London, pp. 44-59) gives brief details of 34 cases of convulsions, which he has grouped together as follows, and of which it may be presumed he would have mentioned any transverse presentation, had one occurred.

Group 1. 8 cases of convulsions occurring during pregnancy, previous to labor :

- Case 1. Head presentation.
- " 2. Rigid os. No mention of presentation.
- " 3. Delivered of a living child.
- " 4. Labor pains came on naturally. Seventh month.
- " 5. Labor ensued at ninth month.
- " 6. Died undelivered at seventh. *Section cadav.* : " Uterus and its contents in a natural state."
- " 7. Os uteri easily admitted two fingers : then three.
" Passage of hand into uterus difficult, otherwise delivery could not have been more easily or speedily accomplished."

Case 8. Labor occurred and she was shortly delivered of a living child.

Group 2. Five cases of convulsions before labor, terminating in delivery.

Case 9. Os relaxed ; membranes ruptured, and patient soon delivered.

“ 10. “ *As coma became more profound,*” turning was accomplished.

“ 11. Twins. Children expelled by natural efforts.

“ 12. “She was delivered of twins.”

“ 13. Labor pains commenced and terminated in delivery of a dead child.

Group 3. Convulsions occurring during dilatation of os uteri.

Case 14. Perforator and crotchet used.

“ 15. Speedily and safely delivered by natural pains.

“ 16. In all respects the same as the last.

“ 17. Forceps used.

“ 18. Artificial delivery. No mention of presentation.

“ 19. No mention of presentation.

“ 20. Forceps when os dilated.

Group 4. Convulsions arising after full dilatation of os uteri.

Case 21. Head. Forceps.

“ 22. Safely delivered. No mention.

“ 23. Head. Forceps.

“ 24. Head. Forceps.

“ 25. Forceps.

Group 5. Convulsions arising after birth of *child* and before birth of *placenta*.

Cases 26, 27, 28. No mention or suggestion of presentation.

Group 6. Convulsions arising after delivery of secundines.

Cases 29, 30, 31. No mention as to presentation.

Case 32. Natural labor.

“ 33. Natural and easy labor.

Cases 34, 35. No mention.

Of these 35 cases, Nos. 7 and 10, it appears, were delivered by version, but the reason given for the operation in No. 10, viz., because coma became more profound, would indicate that it was done to hasten delivery *only*, and *not* on account of transverse presentation.

Dr. Robt. Dunn, F.R.C.S., reports (“Obstet. Trans.” London,

vol. I., p. 280) 4,049 cases of midwifery observed in private practice from 1831-1850, but of these 228 were premature, or abortions. How many were abortions and how many "premature" is not stated. Eclampsia was met with only four times. Of these "the attack in one instance did not supervene until after the birth of the child and expulsion of the afterbirth. In the other cases the forceps were used and craniotomy practised." Thus they were probably all head presentations; at least no mention is made of a transverse one.

In a most valuable collection of cases of puerperal convulsions, no less than two hundred and ninety-seven in number, published by Dr. John W. Richardson, of Tennessee (Nashville *Journ. of Med. and Surg.* 1872, vol. X., N. S., p. 28), it is unfortunate that no mention is made of the presentation or mode of delivery, except in a very few. And while no mention is made of transverse presentation, I am sorry to have to leave out this valuable collection from our list of figures. Excluding them, therefore, let us see how many cases of labor we have now put together. They are as follows:

Dublin Hospital (Drs. Collins, Clarke and Labatt),	48,397
Guy's Hospital,	7,404
Vienna Hospital,	134,345
Dr. Dunn's obstetric cases, <i>excluding</i> the 228 "abortions or premature labors,"	3,872
Total labors,	194,018

Now, if we add together the several collections of eclampsia cases previously cited, viz., Francis H. Ramsbotham's 59; John Ramsbotham's 16; Dr. Merriman's 48; Dr. Lee's 54; Dr. Ingleby's 35, it gives us a total of 212 cases, and this number allowing one eclampsia case for every 500 labors, would represent 106,000 labors. Adding this number, 106,000, to the 194,018 labors obtained above, gives us a total of 300,018 labor cases, with only *one distinctly stated* instance of the coincident occurrence of puerperal eclampsia with transverse presentation *during labor*. With regard to this one case, we have no concise or particular account, which is unfortunate, for a case so extremely unique ought to be submitted to a most searching cross-examination, both with a view of detecting any possible error in the record, and more particularly in order to find out any exceptional conditions in the case itself, by which the rare occurrences

observed might be accounted for. Nothing short of a carefully conducted autopsy could render the examination of such a case complete, for there may have been (which indeed is not very uncommon) an anatomical variation in the position and division of the aorta or its branches, or a variation in the number of the vertebræ, etc.

I do not desire, however, to lay any great stress upon these possibilities; as will at once appear when I confess, and proceed to explain that the clinical proof of my theory, afforded by the foregoing figures, and others might be added, as well as by the quoted statements of the several writers alluded to, really amounts to very little or nothing. In fact, having built up this apparent bulwark of clinical evidence, I must next proceed, as fairness demands, to batter it down, if possible. I think it was Sidney Smith who said: "There is nothing so uncertain as figures, except facts," by which I suppose he means to imply that alleged facts are often found to be otherwise, as figures may be construed to prove almost anything. Since puerperal eclampsia—so say the books—only occurs once in about 500 labors, and since transverse presentation during labor only occurs once in about 230 labors, it would require, excluding any causal relation between the two, 230 times 500 deliveries, viz., 115,000 cases, to produce a single instance of the *coincidence* of a transverse presentation during labor with eclampsia. No wonder, then, that the masters of the Dublin Lying-in Hospital did not meet with such a case in their 48,397 labors; and no wonder that the general practitioner states that the coincidence is extremely rare, for who of us attends 115,000 labor cases? But though the evidence thus presented may go for little or nothing, it must be remembered that it only refers to the coincidence of eclampsia with *transverse presentation during labor*. The real question we are considering is: Whether eclampsia occurs (and, if so, with what frequency) when the child remains oblique, and in the dorso-anterior position, above the pelvic brim *during pregnancy*. That is to say: Given a thousand women in whom this normal (or what I call normal) attitude of the fetus is maintained until approaching full term, and another thousand in which the child presents by the head (face or breech), the presenting part descending into the pelvic cavity two or three months before the full term, in which thousand will the renal troubles, eclampsia, etc., occur most often? Now while, as al-

ready stated, a clinical record of the first thousand is difficult to obtain on account of the necessary examinations not being made, because the women suffer no ills requiring a physician, yet it is very well known that the oblique position of the fetus is the rule in multiparæ (in whom eclampsia, etc., are less apt to occur), and some lateral obliquity of the uterus and consequently of the fetus (the fundus being usually to the right of the lumbar vertebrae) is so common as to be almost universally recognized as a normal condition, and many theoretical explanations have been adduced to account for it. If now we ask ourselves why a *decidedly* oblique position of the child, with its head resting upon one of the iliac fossæ, is *not* admitted to be the normal attitude during pregnancy, in primiparæ and multiparæ alike, the reasons seem to be wanting, if we except the one statement that such presentations are more apt than others to result in transverse presentations *during labor*. But this last is a rare departure from the normal course of things: ordinarily the oblique presentation *does* "right itself," and bring the long axis of the child in line with the pelvic axis. As before stated, the normal attitude of the child during pregnancy *ought*, to be not only different, but opposite to the normal attitude during labor, for the natural purposes of the two periods respectively, viz., *retention* of the ovum and *expulsion* of it, are directly opposite to each other.

I do not think there is at present on record any direct clinical evidence touching the relation of renal troubles, etc., with oblique presentations *during pregnancy* other than that deducible from the occurrence of transverse presentations during *labor*, in the very large majority of which last (though not absolutely in all) it may be inferred the child was oblique before labor set in. There is ample authority for the statement that exceptionally, owing to the irregular contraction of the uterus, etc., a head presentation during pregnancy may be converted into a transverse (oblique) one during labor; such cases have been occasionally observed.

While, however, clinical data on the point in question may at present be wanting, we cannot help but remark that the condition of the woman's nervous system, as regards its so-called "convulsibility," appears to be peculiarly *unexcitable* in transverse labor cases, as is evident from the violent manipulations and operations to which the women may be subjected without

provoking eclamptic seizures, as already noted in the cases quoted from Dr. Francis H. Ramsbotham (see p. 26) and Dr. Lee (p. 28). It would seem that the peculiar irritability of the nervous system, which, during pregnancy, predisposes to spasmodic seizures, must have been totally absent in these cases; and which is probably to be referred to absence of aortic and venacaval compression as previously explained (see p. 17).

In looking through the journal literature of the "Index Catalogue of the Library of the Surgeon-General's office, U. S. Army," under the caption of "Labor Complicated with Transverse Presentations," with a view to discover cases associated with eclampsia, the research embracing over three hundred journal articles (one hundred and sixteen of which I have read with care, and the others by title only), each reporting from one or two to six, eight, or ten cases, I have found only one in which renal disease, albuminuria, eclampsia, and shoulder (transverse) presentation during labor co-existed. This case occurred in the service of Prof. Isaac E. Taylor, of New York, at the Bellevue Hospital. It is reported in the *Amer. Med. Times*, N. Y., Dec. 1st, 1860, p. 382, and is in many respects so interesting, as well as rare, as to deserve special examination, though it is to be regretted that the record is in some particulars less complete than could be desired. Dr. Taylor has kindly sent me, recently, the following brief transcript of the case from the hospital record:

Name of mother, Bridget West; name of father, unknown; nativity, Ireland; single; age 28; number of pregnancies, first; date of last menstruation, Sept. 15th; date of commencement of labor, May 31st, 1860, 6 A.M.; presentation scapula; child turned, died; mother died of uremic convulsions four days afterwards; date and hour of termination, June 1st, 4:30 P.M.; first stage, 24½ hours; second stage, 10 hours; third stage, 15 minutes; number of child, 1; sex, male; weight, 8 lbs.; stillborn.

The published report of the case in the *Am. Med. Times* contains other points of interest, to wit: On admission the patient could "not see out of her left eye, and has not had the use of her left leg *for some time*." The muscles of left arm are partially paralyzed, so that she carries it in a semiflexed position. Sensation on left side of body unimpaired. These motor troubles are explained by the revelations of the autopsy, to wit: "On section of the substance of the brain no fluid was found in the substance of the ventricles. The *optic thalamus* and the *corpora quadrigemina* of the *right* side were *decidedly softened*. Vessels over both hemispheres tinged with blood. Slight

subarachnoid effusion. On the upper posterior portions of the posterior lobes there was found a subarachnoid clot (each clot about the size of a half-dollar) pressing slightly upon the substance of the brain. Kidneys of normal size, fatty, and somewhat granular. Laceration of cervix uteri two inches long.

The patient, on admission, was of rather pale complexion, with marked edema of lower extremities. Convulsions first *began* one hour *after* delivery, the labor being $34\frac{3}{4}$ hours' duration. Urine at *this time* (no record of its *previous* examination) highly albuminous, scanty, and high-colored. Urine continued albuminous, though in a less degree, until death of patient on fourth day.

Now, while this case presents the coincidence of albuminuria and eclampsia with transverse presentation during *labor*, there still remains a doubt as to whether the child was transverse or oblique during *pregnancy* before labor began. In fact, we find in the record some circumstances which of themselves suggest the probability, or at least possibility, of the presentation having *become* transverse during *labor*. First we note that the patient was partially hemiplegic on left side for *some time* before labor began, while the autopsy revealed *decided softening* of those parts of the brain by which left hemiplegia would be produced. It may well be asked whether such a functional derangement of the motor powers would produce irregularity or onesidedness in the uterine contractions and bearing-down efforts, and thus lead to displacement of the child from its original position.

Labor began at 6 A.M., May 31st. First vaginal examination at 7:30 A.M., found dilatation of os had begun; soft parts in good condition; pains pretty good. No mention of presentation. Os not fully dilated till 4 P.M.; she then had a few bearing-down pains, when *suddenly they ceased*. Examination *at this time*, externally and per vaginam, led to the conclusion that the position was an unnatural one, but as there was no engagement of the fetus, and as *the bag of waters remained intact*, the exact diagnosis could not be made. She continued in this condition, and spent a good night, sleeping quietly till 4 A.M. (June 1st), when she had a return of her pains, which, however, were so slight that when Dr. Taylor saw her again at 1:30 P.M. she was walking about the ward. Dr. T. now made out a presentation of the scapula. As the bag of waters was still intact, Dr. Taylor deemed it best to try first version by external manipulation. Several efforts were made to lift the head from the *hypogastric* region and bring it down. These attempts repeatedly failed, even with chloroform. On resorting to version by internal method, Dr. T. felt what he thought was a hand and foot. He

brought down the left hand, the palm of which looked downwards and towards the mother's left thigh. Carrying the hand to the fundus, the left foot was brought down, and delivery completed at 4:30 P.M. She remained comfortable about an hour, when convulsions came on, and were repeated every hour or two during the night, etc. (See *Americ. Med. Times.*)

Such are the items of interest from the published record. I must call attention to the circumstance that no suspicion of a transverse presentation was recorded after the first examination at 7.30 A.M., and not until after the bearing-down efforts had *suddenly ceased* at 4 P.M., the bag of waters *not* being ruptured and the os uteri fully dilated. It is curious, also, that the head is recorded to have been in the *hypogastric region*, instead of in an iliac fossa. Can it be that the case was originally a head presentation, and that the shoulder was forced down during labor—the head partially receding—when the pains suddenly ceased? That the pains frequently cease in cross-births *after* the rupture of the membranes is fully understood, but that they should do so with the os fully dilated, and *without* rupture of the sac, is not so easily explicable. That the shoulder presented when Dr. Taylor felt the scapula at 4.30 P.M., May 31st, after the labor had gone on ten hours, cannot be doubted; but that it presented *originally*, or that the child was transverse during pregnancy, *must*, under the circumstances, *ever* remain in doubt. In contracted pelvis, cases have been observed (Denman) in which, on examination, the head was found presenting, while on subsequent examination the arm was discovered presenting, the head having receded. However, not to prolong the discussion of this case, it may be fairly stated that *evidence in proof of the child having been transverse before labor began is wanting*, and cannot now be supplied.

Of the other case reported in the statistics of the Vienna Hospital I have no particulars whatever. In any future cases of the occurrence of this rare coincidence, it may be hoped all sources of error will be eliminated by a complete history of the case during pregnancy, and, in case of an autopsy, that search be made for anomalous variation in the division of the aorta and in the distribution of its branches. In Quain's "Anatomy of the Arteries" (London, 1844, p. 415), we find the following abstract, giving the *place of division* of the abdominal aorta in 46 bodies examined:

The division occurred on the	{ above the middle, 1 }	
third vertebra (lumbar) :	on " " 2 }	6
	{ below " " 3 }	

The division occurred between the third and fourth vertebra,		12
--	--	----

The division occurred on the	{ above the middle, . . . 43 }	
fourth vertebra :	{ on the middle, or nearly so, 36 }	126
	{ below the middle, . . . 47 }	

The division occurred between the fourth and fifth vertebra,		30
--	--	----

The division occurred on	{ above the middle, 21 }	
the fifth vertebra :	{ below " " 1 }	22

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Hence it is evident that in considering the question of uterine pressure upon the aorta and its branches we cannot assume, as is usually done, that this blood-vessel is always located and divided in the same place, and every autopsy (in cases dying of eclampsia) which essays to be complete must include an examination of this matter. Dr. Quain further tells us (p. 417) that the end of the aorta, instead of being always to the left of the median line of the body, is "frequently observed lying on the middle of the bone, without any deviation to either side, and in a few instances it was inclined to the right of that point." This also, in considering the theory of uterine pressure, should receive attention in post-mortem examinations.

Leaving it, therefore, for future clinical observations to determine whether the uremia, eclampsia, etc., of pregnancy will occur when the child remains oblique and above the brim *during pregnancy*, it may here be further remarked that observations as to the position of the fetus during the several months of pregnancy, and as to the frequency of eclampsia during the several months, show a remarkable synchronism between eclampsia and *unoblique* positions of the child. Thus cases of eclampsia are exceedingly rare before the sixth month of pregnancy, and are more and more likely to occur during the several succeeding months; so we find from the results of observations made by Dubois at the Maternity Hospital of Paris "that the position (presentation ?) of the fetus, with the head lowest and over the os uteri does not begin to be assumed till about the end of the sixth month, and that it is taken up with increasing fre-

quency and certainty from that period onwards to the full term of pregnancy." (Leishman's "System of Medicine," Third Am. ed., 1879, p. 128.)

To this statement I may add that during the first few months of pregnancy the uterine walls are (comparatively) solid and inelastic, while the fetus is soft; but there comes a time later on—beginning about the sixth or seventh month—when the solidity and inelasticity of the fetus increase, while the womb loses these qualities and becomes soft, supple, and elastic to such a degree that the formerly soft embryo is now sufficiently solid to give shape and position to the uterine cavity surrounding it, when, and still more so as pregnancy advances, the posture of the fetus becomes susceptible of change by forcible impressions made upon the exterior of the abdomen by corsets, dress, etc. And thus it would appear the normally "transverse" (really oblique) position of the fetus is more likely to be disturbed by these external impressions after the sixth month, and hence the greater liability to albuminuria, eclampsia, etc., after that time.

As relevant to the *causes* of the normal attitude of the fetus in utero, about which there has been so much discussion and difference of opinion by Dubois, Simpson, Scanzoni, Duncan, and others, it may be of interest here to observe that the matter will be at once simplified, and the inquiry substantially changed, when we recognize the oblique position as being normal, and the presentation of a head as an abnormal deviation produced by external factors, for then the gravitation theory will not be so easily called in question, inasmuch as Dubois ascertained by plunging the fetus in water and suspending it by the funis, that it was *not the head*, but the *scapula* or *back* which hung downwards and first touched the bottom of the vessel (Leishman, p. 126). Thus while the fetus floats during the early months, it would gravitate (the woman being erect) into an oblique or shoulder "presentation," the "position" being dorso-anterior, and it is probable this early posture, in the absence of disturbing influences from without, would persist during the later part of gestation, or until within a few days of delivery.

21. *Treatment Deducible from the New Theory.*—If the theoretical views now presented be true, the treatment deducible from them will be easily reached. To prevent albuminuria, nephritis, etc., during pregnancy, the causes interfering with normal obliquity of the child (viz., corsets, coitus, etc.) must be

removed or forbidden. After the third or fourth month, when the womb begins to rise out of the pelvic cavity, every impediment to its assuming its normal oblique position should be, even thus early, interdicted; and so with every influence likely to (as Dr. Barnes puts it) "drive" or "force" the womb down into the pelvic cavity, whether during the "last three months" or the preceding three. Everything likely to disturb the (as already described) nicely adjusted balance between the forces determining the ascent and descent of the pregnant womb must be avoided or removed. (See pages 19, 20.)

When, on examination during the later months, the womb and child are found *unoblique* and forced prematurely into the pelvic cavity, the faulty position must be remedied. To do this, I should be inclined to recommend complete anesthesia to relax the abdominal wall, and then bipolar manipulation, lifting the lower segment of the womb and child out of the pelvic cavity and towards that iliac fossa opposite to the side on which there still remains a slight deviation of the fundus (such will usually be the case) with one hand, and with the other assist the fundus to get *more decidedly* on the *side* of the lumbar vertebræ. Placing the woman continuously, for a few days perhaps, in the latero-prone position and on her right side, the hips elevated on pillows, or for a short time in the genu-pectoral position, might accomplish the result, even without manipulation *per vaginam*.

Should the worst have almost come to the worst, with pronounced albuminuria, nephritis, and even eclampsia, there would still be substantial hope that the alarming phenomena would disappear by replacing child and womb obliquely above the brim, thus relieving renal congestion and cerebral arterial tension, as well as the "uterine irritation" of a prematurely distended cervix, etc. Whether the desired replacement will be accomplished by posture alone, or by manipulation alone, or by both combined, future clinical experience must determine.

Fortunately, however, we are not even now entirely lacking in clinical demonstration of the methods suggested and their utility.

Dr. Barnes ("Syst. of Obstet.," p. 301-302), under the caption of "Postural Treatment" of puerperal convulsions, tells us that "Graily Hewitt and Routh, believing that the disturbances of the abdominal and renal circulation, caused by pressure of

the gravid uterus, exercised a powerful influence in provoking eclampsia, placed the patient in such a position as to diminish this pressure. Routh had seen marvellous benefit from the knee-elbow posture." Dr. Barnes only adds on this matter the following brief comment: "It must often be difficult to adopt this posture; but the side or semi-prone posture may be tried." This brevity is perhaps to be accounted for by the circumstance that he does not believe in the "pressure theory" of eclampsia, etc., but refers them more directly to "changes in the blood." I have not been able to find any record of Hewitt and Routh's observations, except that of one case by Dr. Routh (*Brit. Gynec. Journ.*, vol. I., p. 315) mentioned by him before the Brit. Gynecological Society during a discussion in which he said "he had already mentioned elsewhere (reference not given) a case of *long* and *continued* eclampsia, in which the prolapsed cord had slipped out, but the moment he placed the woman on her belly (!) to induce its resuming its normal position, the fits stopped and did not recur. He explained this by the removal of pressure, and Dr. Bantock had also noticed that large fibroids of the uterus had induced albuminuria which at once disappeared on removal of the tumor, from the cessation of pressure, as he (Dr. Bantock) also believed." In a subsequent discussion before the same Society (Part V. of *Journal*, May, 1886, p. 38) Dr. Routh again mentioned this case, saying: "It was a shocking case to look at, and had resisted treatment. When being about to deliver by forceps,¹ the cord prolapsed. He placed her on her belly to allow reduction of the cord, after Dr. Simpson's method. The cord was reduced, and the convulsions at once ceased, the pressure being thus removed from the *kidneys*" (?). No comment appears to have been made by the Society on Dr. Routh's observation. Dr. Bantock's observations (mentioned by Routh) refer to a case of fibroid tumor in which there was pronounced albuminuria and general anasarca. Within twelve hours after removal of the tumor there remained only a trace of albumin, and within three days the anasarca had disappeared. In a case of ovarian tumor, the albuminuria disappeared even after a preliminary tapping (*Brit. Gynec. Journ.*, vol. I., p. 314).

With relation to Dr. Routh's case, it is scarcely possible to agree with him in the remark that the immediate cessation of

¹ It was, therefore, presumably, a head presentation.

the fits was due to removing pressure *from the kidneys*. Uremic contamination of the blood could not have been so rapidly relieved. I should rather believe the convulsions ceased because removal of pressure from the aorta and vena cava at once relieved tension of the cerebral arteries, and allowed the normal proportions of venous and arterial blood in the brain to be reinstated. (See caption 17, p. 17). And again, the genu-pectoral position relieved the distended cervix and os uteri from the pressure of the presenting head, thus removing a peripheral excitator of the eclamptic paroxysms.

Dr. Lusk ("Sci. and Art of Mid.," p. 571) remarks that "Löhlelein recommends placing the woman in the latero-prone position, in order to diminish as much as possible the pressure upon the *ureters* and upon the *renal veins*" (?). Dr. Lusk makes no farther comment on this method.

Dr. Aveling (on "Posture in Gynecic and Obst. Pract.," p. 132) states that the postural treatment of convulsions may be preventive or curative, and both ends are to be obtained in the same manner. He recommends that patients during gestation, suffering from albuminuria, should not remain upright longer than necessary. "When convulsions have arrived, and parturition cannot be completed, such posture should be recommended as will remove the uterine pressure. The semi-prone position, with the hips raised, would be the best." He, however, gives no clinical data, farther than to refer to the case published by Dr. Brown-Séguard, and of which also Dr. Bedford says: "Dr. Brown-Séguard has positively ascertained the influence of pressure upon the renal vessels in a lady who had albumin in her urine during the ninth month of pregnancy. He placed her in such a position that the pressure was much diminished, and after a certain time the urine ceased to contain albumin. When the ordinary attitude was resumed, there was soon a reappearance of albumin in the urine." (Bedford's "Obstet.," 3d ed., 1867, p. 508). I cannot assent to the relief being due to removal of pressure upon the renal blood-vessels, as I have already explained. But no matter about this: for, if placing the woman in a posture that will divert uterine pressure from the spinal column towards the abdominal wall, and from the pelvic cavity towards the diaphragm, *will relieve the renal trouble*; that is what we require.

If it be objected that placing the woman in the genu-pectoral position, when eclampsia occurs during labor, would cause the

presenting part to recede and thus retard the delivery, it may be replied that the temporary maintenance of this posture, say for an hour or two, or even longer, if necessary, might so far restore the normal proportion of venous and arterial blood in the nerve centres as to reduce the "convulsibility" of the nervous system, and permit of speedy delivery by podalic version, the patient being *now* able to bear the necessary manipulation without an eclamptic fit being excited. Moreover, the peripheral excitor of the convulsion—pressure of the os and cervix uteri—would be relieved. Furthermore, most cases of eclampsia during labor are to some extent *premature* labors. If, therefore, the genu-pectoral posture should postpone delivery (the waters remaining intact), so much the better, provided the complication of eclampsia and renal trouble were removed.

22. *Evidence conflicting with the theory.*—On this point it may be said, *first*: that while head presentation, with (in primiparæ) descent of the head below the pelvic brim "three months" before full term, is so common as to be recognized as the *usual* condition (see Lusk's "Sci. and Art Mid.," 3d Am. ed., pp. 84, 91; and Barnes' "Syst. of Obstet.," 1st Am. ed., 1886, p. 200, 201), yet renal troubles, albuminuria, uremia, and eclampsia are comparatively *rare*. To this statement we may reply that, in all pathological conditions, the factors or causes of disease exert their deleterious effects in *different degrees*. Nature is adequate, in many instances, to contend against, compete with, and outvie the evil by compensative processes. And again in some, perhaps many cases, the (what I call) abnormal position of the child may, owing perhaps to large size of the pelvis or other unknown circumstances, occur and be tolerated without material ill effects, or only with moderate functional derangement; while in others the worst results are produced. Thus we find albuminuria, etc., during pregnancy, in all shades of degree. We find it to appear and disappear—to come and go—just as might be expected from movement of the uterus, or active motions of the child, or change of posture of the patient, these changes altering the degree of pressure made upon neighboring blood-vessels. I have nowhere contended that want of fetal obliquity and the occurrence of descent of the head will *always* lead to renal trouble; but rather that, when the child remains obliquely above the brim, etc., renal troubles etc., will *not* occur.

Secondly: It may be objected that when albuminuria and uremia have occurred, they are often relieved by medicinal and other remedies while the position of the womb and fetus still remains unchanged. This is undoubtedly true. But, on the other hand, we recognize in these methods of treatment compensative processes by which the evil has been mitigated and perhaps the epoch of severer danger postponed. Surely there are other cases in which such compensative measures utterly fail, and premature labor, with death of child and mother, occur in spite of treatment. Furthermore, who shall say that restoration of the child and womb to their normal (?) position would not be a more speedy and preferable method of treatment than prolonged medication with violent drugs? If the genu-pectoral posture will relieve immediately, it should be practised, and the drugs be discarded.

Thirdly: It is often alleged that eclampsia, etc., occurs with more frequency in *narrow pelves*, in which there is also a greater frequency of *transverse presentation*. I reply that this refers to transverse presentation during *labor*. Narrow pelves are exactly those cases in which head presentations *before* labor are liable to change to oblique ones *during* labor. Moreover, it may still be questioned whether the statement that eclampsia and contracted pelves are frequently coincident be really true. We need further information on this point. Otto Spiegelberg states ("Trans. Am. Gynec. Soc.," vol. II., p. 165) that "eclampsia is remarkably frequent in twin pregnancies, although it has been *proved* by statistics *not* to be so in hydramnios, or with *narrow pelves*" (Spiegelberg quotes from Löblein, in the *Zeitschrift f. Geburtshülfe u. Frauenkrankheiten*, I., 1875, p. 64).

Fourthly: The theory I have presented fails to explain the occurrence of uremia, eclampsia, etc., in the early months of pregnancy, as well as the cases of eclampsia that occur after delivery, unless we conceive, with respect to the latter, which is not unreasonable, that the ordeal of a long labor, coupled perhaps with laceration of the cervix or other soft parts, and with exhaustion or hemorrhage, were, to speak figuratively, last straws on the camel's back, by which the final overthrow of the nervous system into an eclamptic paroxysm, was brought about. The convulsion, it should be remembered, is often one of the

final phenomena—the last link in the chain of a long series of antecedent pathological conditions.

23. *Conclusion*: Fully aware that the views I have maintained are, in the main, theoretical, and that they require clinical evidence to prove or disprove them, I hope the subject has been presented in such a manner as will lead to new lines of research which may end in some practical good. Especially is it desirable that we should study again, and, if necessary, reconstruct our ideas of what constitutes the normal attitude of the infant during the later months of pregnancy. I cannot dismiss the idea that the recognition of an oblique, dorso-anterior position above the pelvic brim, during the later months, as the truly *physiological attitude* for both primiparæ and multiparæ will open a door for the philosophical explanation of phenomena that have hitherto been puzzling and inexplicable both in the domain of pathology and physiology.

In conclusion, I beg to acknowledge my indebtedness to the library of the Surgeon-General's office, U. S. Army, for the facilities for research it has afforded me in the preparation of this paper; and it gives me pleasure to tender my most cordial thanks to the kindly assistance given me by Drs. J. S. Billings and Robert Fletcher, of the Surgeon-General's office, as well as by Dr. Thos. W. Wise and his assistants in the library. I must also tender my thanks to Dr. Thomas J. Chew, of the "Washington Asylum;" to Dr. P. J. Murphy, of the "Columbia Hospital," of this city; and to Prof. Thos. Opie and his assistants, Drs. L. F. Ankrum and W. P. Spratling, Jr., of the "Maryland Lying-in-Asylum," for their kind assistance.

